MINUTES OF MEETING OF
SUBCOMMITTEE 6 ON VALVES AND WELLHEAD EQUIPMENT
June 15, 2006
Hilton Atlanta Hotel
Atlanta, Georgia

1. OPENING REMARKS – George Huntoon

• Call to Order and Introductions – Meeting called to order by George Huntoon, SC6 Chairman. Opening comments by chairman. Introductions by each person present. A count of attendee was taken. There were 32 present. 12 voting members. A quorum for the meeting had been established. An attendance list was circulated (Attachment 1).

• Awards- NONE

• Review Agenda – The Chairman reviewed the agenda and work accomplished since the last annual meeting.

• Summary of SC6 Work – SC6 Pre-meeting Summary (Attachment 2) attached to back of agenda. Chairman discussed. Reviewed work previously done. Many items completed. Of particular note is the work competed by the 6D Task Group on Repair & Remanufacture of Pipeline Valves.

• Approval of Minutes from June, 2005 Meeting in Calgary – Chair reviewed previous minutes. Archives go back to 2001. Call for additions and corrections. Motion made, second, and passed to approve minutes as written.

2. GENERAL ISSUES – George Huntoon

• Status of publications currently under 5 year review:

- Status of Current Ballots – Jonathan Jordan reviewed status of items to be reaffirmed. Specifications will only need a 5 year review in the future. Bulletins and Technical reports will not need reaffirmation. (See Attachment 3)

- There are no 2006/2007 Re-affirmations Required

• Update on SC6 Research Programs – George Huntoon

2004 - Metallic material limits for wellhead equipment (Phase 2) – Ron McGregor – (See Attachment 4).
Quick review of Phase I and Phase II was reported for the first time at this meeting. All information and data reviewed by metallurgist on AWHEM task group. The final report will be posted independently on the SC6 meeting materials webpage (same as these minutes). SC6 Chairman asked what the forging ratios were. Rod answered that they were normally greater than 3.75:1. Reis Langereis asked what was the relevance of the results. Ron answered that reliable data from the analysis could be used in HPHT work.
currently under consideration. John Fowler asked if we intended to update. Annex G. Answer is, yes, eventually. Chair said that the Phase I and II work would be captured in a Technical Report. Consideration was given to the adopt-back of ISO 10423. Concern was expressed about duplication of data in various API documents. This program is complete. Chairman may want to entertain a new work item for more work.

2005 - Capability of API 6A 5-1/8” 15000 PSI Flange – John Fowler – (See Attachment 5) Report on analysis was given. Data is for inclusion in API 6AF2. Question asked about how data compared to previous data. Compares well There was also a question on bolting stress. Stress data is available. What temperature range was used in the analysis? Answer is that this is all at room temperature. Discussion on how to publish data. API will decide. Motion made and second to accept report and approve recommendations included in the report. Motion passed.

2006/7 - No new proposals for SC6

- **20K psi Equipment Research Proposal** – George Huntoon – Chair reported on HPHT meeting held previously this week. White paper is being written for MMS funding. A recommended practice will be written. Question asked: will 30K flanges be considered? – we do not know, but work does exist. (Withdrawn API Spec 6AB, March 1983)
- **Subcommittee 6 Participation: Voting, Attendance and Roster** – George Huntoon – Chair will discuss this at a later time. New participation is requested. (Especially users and independents)

3. **PIPELINE VALVES ISSUES** – Rick Faircloth

Report given. (See Attachment 6)

- **6D-9906-1 / Status of recent published document API RP 6DR** – Document is available through API.

- **6D-2002-2 / Status of Ballot #819 - Adoption of ISO 14723, Subsea Pipeline Valves** – Standard has been developed and issued. Ballot report was given. It passed by 65% with 100% approval. Some comments. Will be published as API Spec 6DSS. Comments will be addressed by January 2007. Chair reported on some reservation concerning lack of testing. This will be worked on a parallel process. SC6 will probably have a winter meeting this year for a report on this and other SC6 issues.

- **Status of next revision to API Spec 6D / ISO 14313** – Now out for ballot in ISO as a DIS. Comments by September 1. Then back to technical group. Meeting in October or November. Adopt-back and approval may be done at the same time. Hopefully, regional modification annex will not be needed.

**Motion made second and passed to approve the report.**
4. **SUBSURFACE SAFETY VALVE ISSUES** – John Yonker for David Ott

Group has not had any meetings this year.

- 14A/B Revisions/Corrections Task Group Activities – Documents published.

- 14A-2006-04-1 Special Letter Ballot for Spec 14L Revision – Ballot will close on July 21st.

- Report was made on New Work Item to start process in ISO on Sub-surface Barrier Valves. (See Attachment 7) **Motion made and seconded to endorse the new work item to go to TAG.** Motion passed.

Chairman recognized John Yonker’s retirement. **He will be missed.**

Break was called at 9:35. Reconvened at 9:52.

5. **WELLHEAD ISSUES** – George Huntoon

- Work item 6A-2001-06-3, Equivalent normative references – Chairman reported that this is being considered in ISO discussion for ISO 10423 update.

- Work item 6A-2002-06-3, Review Definitions of Design Verification and Validation – Chairman gave background on this time. Definitions need to be the same in all documents. Definition in API Spec Q1 will be used. John Fowler gave additional comments concerning the terminology. Eric Weiner commented that this will not be that easy to fix because of usage in current documents. Rick Faircloth stated that we need to do what Q1 says to be consistent. Chair asked what the best way to correct this is. Chair appointed a Task Group to recommend a fix for this issue. Austin Freeman, Chairman, Sterling Lewis and Eric Weiner were appointed to the task group.

- Work item 6A-2003-03-1, API Standard for Alloy 718 Material – Tim Haeberle – A status report was given. (See Attachment 8) Work is done. Document with addendum has been issued. Comments concerning grain size issue has been resolved. (Material on grain size issue is included in these minutes.) Another issue is forging ratio. It is recommended to be 4:1 by BP, but is to be resolved. It was reported that other requirements are being tacked on by various users. Data needs to be collected on field failure events. Task group has completed its work.

- API RP 14H, 4th edition, July 1, 1994 Installation Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves – Jonathan Jordan reported that the ballot process report will be made at the 2007 Winter Work Week meeting. Ballot resolution discussion – John Yonker had previously reported on the ballot comment resolution and the document should be ready for publication.
• Work Item 6A-2006-02-1, Clarifications to PSL 3G Testing Requirements – Chairman reported about previous presentation in last years minutes on interpretations and gave background. (See Attachment 9) He also reported on the Work Group meeting. **Chair moved that the three items from the Work Group meeting be balloted as a revision to the API Spec 6A.** There was some discussion. David Zollo expressed concern on the need for extended hold time on the hydrostatic seat test. **Motion passed.**

Chair presented an additional recommendation concerning application of backseat test on Subsea Valves … make it optional. The recommendation was discussed. Motion was made to make a change to the document concerning this recommendation. **Motion died for lack of a second.**

An additional recommendation was made to include requirements for chart recording during the gas test. Chair made motion to add requirement for chart recording to API Spec 6A gas seat testing. **Motion was seconded.** There was discussion the type of monitoring devices that could be used. David Zollo recommended using some of the wording from API Spec 17D on pressure settling. **Motion was withdrawn and a Work Group was appointed to make a recommendation at the Winter Work Week meeting. David Zollo was appointed as chairman.**

6. **ONE WORLDWIDE WELLHEAD STANDARD** – George Huntoon & Ries Langereis

• Continued discussion on combining ISO 10423 & API Spec 6A into one jointly maintained standard

• Report on ISO TC67/SC4/WG3 Activities - R. Langereis - Ries Langereis reported on the presentation at the ISO work group 3. **(See Attachment 10) History of the standard was presented. Updating of ISO 10423 is being promoted, including requirements on NACE. Issues on perceived setbacks were presented: Allowance for castings, repair and remanufacture. An action list was presented to make ISO 10423 and API Spec 6A the same.**

The Chairman reported that a strategy to standardize the two document involves some restructuring and planning. Acknowledgement of AWHEM contribution was made and is reported to have worked very well. Perhaps core-documents should be considered, but after the 20th Edition of 6A. A work plan is being developed for next years work. Chairman announced his intention to retire as SC Chairman at the end of 2007.
7. NEW WORK ITEMS

• Spec 6A Repair & Remanufacture Document – The Chairman reported on a rising need by operators for repair specifications, especially subsea tree equipment i.e. 6A valves. The R&R task group is being re-initiated because of user needs. Members are volunteers previously noted. (See Attachment 11) Sterling Lewis is appointed as chairman. This document is specifically for Operator Owned Equipment. Attention needs to be given to making it acceptable to ISO 10423 inclusion.

• Request from SC18 – Product Specification Review of “Processes Requiring Validation” – Benefield/Fairecloth (SC18 Liaisons) – This item was discussed. Chairman wants to see what will come out of SC18, then an action will be proposed.

8. OTHER BUSINESS

• Solicitation of Ideas for New SC6 Standards Development - Jonathan Jordan reported on task group that has been set up. Each SC6 member is requested to provide feedback. The core documents could be considered. Members are encouraged to make suggestions for new documents to API staff.

• AWHEM recommendation on revisions to API Spec 6A – Jerry Longmire – Report on recommendations was presented. (See Attachment 12, dated Sept 2006) Chairman reported that these will be included in proposed revisions to API Spec 6A

• Errata 3 to API Spec 6A – Jonathan Jordan reported that errata is available. Other changes are in process.

• Date of Edition needs to be on each page – Jean Brunjes pointed out that this needs to be done on future documents.

• NACE Report – The NACE Liaison, Harry Byars, provided the attached report (see Attachment 13).

9. ADJOURNMENT

Motion made seconded passed to adjourn at 11:48.
**RECORD OF MEETING ATTENDANCE**

**GROUP** SGC  
**CHAIRMAN** Huntcar  
**MEETING** June 24, 2015  
**TIME 8:00a - DATE 4-15**

---

Committee members should make changes to their personal record on the attached roster. Visitors adding names to roster will not automatically become members of the committee.

Indicate BEFORE YOUR NAME if you are:

(M) Member of the Committee in session  
(R) Representing a Committee Member (if so, state member’s name)  
(V) Visitor – ONLY voting members or their Representatives may vote  
(S) Staff

<table>
<thead>
<tr>
<th>NAME (Please Print)</th>
<th>COMPANY/PHONE or email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jonathan Jordan</td>
<td>API, <a href="mailto:jordonj@api.org">jordonj@api.org</a></td>
</tr>
<tr>
<td>George Huntcar</td>
<td>BP</td>
</tr>
<tr>
<td>Mike Miller</td>
<td>Dril-Quip, <a href="mailto:mike.miller@drilquip.com">mike.miller@drilquip.com</a></td>
</tr>
<tr>
<td>David Zoll</td>
<td>En Tec, <a href="mailto:david.zoll@en.com">david.zoll@en.com</a></td>
</tr>
<tr>
<td>Roy W. Benefield</td>
<td>FMC Tech Inc, <a href="mailto:benefitfield@nschurches.com">benefitfield@nschurches.com</a></td>
</tr>
<tr>
<td>John H. Fowler</td>
<td>OLR, <a href="mailto:Fowler@rola.com">Fowler@rola.com</a></td>
</tr>
<tr>
<td>Sterling Lewis</td>
<td><a href="mailto:Sterling.F.Lewis@exxonmobil.com">Sterling.F.Lewis@exxonmobil.com</a></td>
</tr>
<tr>
<td>Henry Wong</td>
<td>FMC Technologies, <a href="mailto:Henry.Wong@fmc.com">Henry.Wong@fmc.com</a></td>
</tr>
<tr>
<td>Austin Freeman</td>
<td><a href="mailto:Austin.Freeman@haliuxet.com">Austin.Freeman@haliuxet.com</a></td>
</tr>
<tr>
<td>John Vonker</td>
<td>Haliuxet, <a href="mailto:John.Vonker@haliuxet.com">John.Vonker@haliuxet.com</a></td>
</tr>
<tr>
<td>Ron McGregor</td>
<td>Halliburton, <a href="mailto:ron.mcgregor@halliburton.com">ron.mcgregor@halliburton.com</a></td>
</tr>
<tr>
<td>Chris Patirncia</td>
<td>Shell, <a href="mailto:chris.patirncia@shell.com">chris.patirncia@shell.com</a></td>
</tr>
<tr>
<td>David Cornelsen</td>
<td>Walworth, <a href="mailto:dacornelsen@walworth.com">dacornelsen@walworth.com</a></td>
</tr>
<tr>
<td>David Pang</td>
<td>Bureau Veritas, <a href="mailto:david.pang@us.bureauveritas.com">david.pang@us.bureauveritas.com</a></td>
</tr>
<tr>
<td>Mike Larkin</td>
<td><a href="mailto:Mike.Larkin@camcom.com">Mike.Larkin@camcom.com</a></td>
</tr>
<tr>
<td>Eric Wehner</td>
<td>Cameron/eric.wehner@c-a-m.com</td>
</tr>
<tr>
<td>Ben Holgate</td>
<td>wcpc/ <a href="mailto:ben.holgate@woodgroup.com">ben.holgate@woodgroup.com</a></td>
</tr>
<tr>
<td>Robert Barnett</td>
<td>wCPC/bob.barnett@woodgroup.com</td>
</tr>
</tbody>
</table>

**THIS FORM MUST BE RETURNED TO THE API STAFF**

API standards meetings are open to all interested parties. By participating in the standardization process, you agree: (1) to fully comply with API’s policies and procedures governing standards, (2) that once balloted and approved by API, API shall have the sole and exclusive right to use any materials that are submitted by the participant for use in the standard, (3) you will not provide any material that will violate the rights of any third parties including, but not limited to, patents, copyrights, trade secrets, and trademarks, and (4) to disclose the existence of any patented technologies in the material that you provide.
<table>
<thead>
<tr>
<th>NAME (Please Print)</th>
<th>COMPANY/PHONE or email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shyam Patel</td>
<td>BP <a href="mailto:shyam.patel@bp.com">shyam.patel@bp.com</a></td>
</tr>
<tr>
<td>Jean Brunjes</td>
<td>VECOGRAY <a href="mailto:jean.brunje@vetco.com">jean.brunje@vetco.com</a></td>
</tr>
<tr>
<td>Tim Haeberle</td>
<td>VECO Gray <a href="mailto:tim.haeberle@vetco.com">tim.haeberle@vetco.com</a></td>
</tr>
<tr>
<td>Brett Puckett</td>
<td>SPECIAL METALS <a href="mailto:bpuckett@specialmetals.com">bpuckett@specialmetals.com</a></td>
</tr>
<tr>
<td>Scott Higginson</td>
<td>BP, <a href="mailto:higgison@bp.com">higgison@bp.com</a></td>
</tr>
<tr>
<td>Ries Langereis</td>
<td>LANGEREIS R/ CAMERON div.com</td>
</tr>
<tr>
<td>Ricki Spees (J. Swenend)</td>
<td>FLOWSERVE <a href="mailto:R.Spees@flowserve.com">R.Spees@flowserve.com</a></td>
</tr>
<tr>
<td>Maarten Kuipers</td>
<td><a href="mailto:Maarten.kuipers@Mokveld.com">Maarten.kuipers@Mokveld.com</a></td>
</tr>
<tr>
<td>Svein Norland</td>
<td>STATOIL <a href="mailto:svno@statoil.com">svno@statoil.com</a></td>
</tr>
<tr>
<td>Hardy Byars</td>
<td>Self, ANGE Lisa, <a href="mailto:obyars@swbell.net">obyars@swbell.net</a></td>
</tr>
<tr>
<td>Dele Ajakaye</td>
<td>NOSDRA NIGERIA, <a href="mailto:djakaye@hotmail.com">djakaye@hotmail.com</a></td>
</tr>
<tr>
<td>David O'Donnell</td>
<td>Nov, 7139375711 <a href="mailto:david.odonnell@nov.com">david.odonnell@nov.com</a></td>
</tr>
<tr>
<td>Joe Leroy</td>
<td>MMS <a href="mailto:Joseph.leroy@MMS.gov">Joseph.leroy@MMS.gov</a></td>
</tr>
<tr>
<td>Oscar Felizola Souza</td>
<td>PETROBRAS <a href="mailto:oscar.souza@petrobras.com.br">oscar.souza@petrobras.com.br</a></td>
</tr>
<tr>
<td>Neil Reeve</td>
<td><a href="mailto:neil.reeve@shelby.com">neil.reeve@shelby.com</a></td>
</tr>
<tr>
<td>T. Bart Bartholomeau FMC</td>
<td><a href="mailto:debart.bartholomeau@fmc.com">debart.bartholomeau@fmc.com</a></td>
</tr>
<tr>
<td>Dan Meyer</td>
<td>CAMERON/DAN.MEYER@C-A-M.COM</td>
</tr>
<tr>
<td>Jerry Longmire</td>
<td>WOOD GROUP PRESSURE CONTROL <a href="mailto:JERRY.LONGMIRE@WOODGROUP.COM">JERRY.LONGMIRE@WOODGROUP.COM</a></td>
</tr>
<tr>
<td>Rick Faircloth</td>
<td>CAMERON/RICK.FAIRCLOTH@C-A-M.COM</td>
</tr>
<tr>
<td>Work Item</td>
<td>Item</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>6A-2001-06-3</td>
<td>Equivalent normative references</td>
</tr>
<tr>
<td>6A-2002-06-3</td>
<td>Define Design Verification and Validation</td>
</tr>
<tr>
<td>6A-2006-02-1</td>
<td>PSL 3 Testing Requirements</td>
</tr>
<tr>
<td>14A-2001-06-2</td>
<td>Revision of API 14H, installations, maintenance and repairs of SSV &amp; USV</td>
</tr>
<tr>
<td>6D-9906-1</td>
<td>Repair and Remanufacture Issues, Spec 6D</td>
</tr>
<tr>
<td>6D-2002-2</td>
<td>Evaluate ISO 14723, Subsea Pipeline Valves</td>
</tr>
</tbody>
</table>
Reaffirmations

Revised API Procedures
Presented June 15, 2006
Old Procedures

- Previously API’s ANSI accepted “Procedures for Standards Development” (Annex F in S1) required all publications to be reaffirmed every five to seven years.

- Process required Letter Ballot.

- Applied to all Standards, defined as Specs, RPs & TRs/Buls.
New Procedures

- Same reaffirmation process continues to apply to ‘Standards’
- ‘Standards’ are now (May ’06) defined to exclude Bulletins and Technical Reports:

5.5.1 Bulletins and Technical Reports

Documents that convey technical information on a specific subject or topic and are generally issued on a one time-basis, are not standards and are not addressed by these Procedures.
New Procedures

- Going forward, TRs (Buls are no longer preferred) for initial publication and revised editions can be approved by voice vote, if so agreed.
- They are not ‘Consensus Documents’.
- This has bearing on research results to be presented shortly.
SC6 Reaffirmations

- Specs 6FA, 6FB, 6FC and 6H
  Reaffirmation Ballots Open (close 7/10/06)

- Bulletins 6AF1, 6AF2 and 6J & TRs
  6F1, 6F2 and 6J no longer need to reaffirmed

- None Required in 2006/2007

- Potential New Editions of TRs 6AF and 6AF2 to be discussed
To be added to Spec 6FA, 6FB & 6FC, as an editorial insertion:

Standard References Paragraph:
Referenced standards may be either the applicable edition shown herein or the latest revision, provided the manufacturer can show that the latest edition meets or exceeds requirements of the specific edition listed. When the latest edition is specified, it may be used on issue, and shall become mandatory six months from the date of the revision.
In clause 2, **Referenced Standards**, make the following changes:

- To first sentence, add, “latest edition unless specified otherwise.”
- Change “Bull 6F1” to “TR 6F1”
- Change “Bull 6F2” to “TR 6F2”

**Reason for change:** Clarify edition of reference standards, and correct typographical error (6AF).
Metallic Material Limits for Wellhead Equipment Used in High Temperature for API Spec 6A and Spec 17D Applications
Phase II – Final Report

JUNE 2006

Sponsored by: API SC6
Conducted by: Association of Well Head Equipment Manufacturers
PHASE I TEST PROGRAM - REVIEW

• Completed in 2004
• Tested 6 alloy materials - 6A, PSL 3 and 75 Ksi
• Tested 5 heats of each material
• Material furnished by 17 different suppliers
• Tested by three labs at 300, 350 and 450ºF
• Published Yield Strength reduction ratios for 300, 350 and 400ºF
## PHASE 1 RESULTS REVIEW

**HPHT Metallic Material Yield Strength Reduction Ratios**

Shown in % reduction from Room Temperature (75°F)

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature- ºF</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>AISI 4130</td>
<td>91</td>
<td>90</td>
</tr>
<tr>
<td>AISI 8630</td>
<td>92</td>
<td>90</td>
</tr>
<tr>
<td>2-1/4 Cr 1 Mo</td>
<td>93</td>
<td>91</td>
</tr>
<tr>
<td>AISI 4140</td>
<td>93</td>
<td>91</td>
</tr>
<tr>
<td>AISI 410 SS</td>
<td>91</td>
<td>90</td>
</tr>
<tr>
<td>F6NM</td>
<td>92</td>
<td>91</td>
</tr>
</tbody>
</table>
PHASE II TEST PROGRAM

• OBJECTIVES
  – Examine mechanical properties of metallic materials used for API 6A and 17D wellhead equipment for service above 250°F
  – Test 5 different CRA materials meeting API 6A, PSL 3 and 100 - 130 Ksi conditions furnished by several suppliers
  – Determine yield strength reduction ratios at temperatures of 300, 350 and 400°F
PHASE II Materials

- 25 Cr Super Duplex (PREN >40 )
- ASTM A453 Grade 660
- 718
- 725/625 Plus
- 925
Challenges in Phase II

- Gratis material was difficult to acquire since CRA is expensive and in short supply
- Due to difficulty in procuring 725 and 925, Special Metals Test Data used for some heats – tested at different temperatures
- Collected enough raw material or test data for 5 heats each of five material types
- Purchased one heat of 25 Cr Super Duplex
- Some test data discarded when extensometer or test specimen slipped
TESTING

• ASTM E21 - .505 dia.
  at RT, 300, 350, 450°F

• 3 Labs – NIST certified
  – Accu-Test
  – An-Tech
  – MTEC

• 5 mat’ls X 5 heats X 4 temps X 3 labs = 300 tests (use of available test data reduced tests to 228)

• TS, YS, Hardness
ANALYSIS

• For each material:
  – Average results at each temperature, all labs
  – Ratio the results at temperature with RT
  – Plot the ratios and curve fit
  – Determine reduction ratios at 300, 350, 400°F

• Use pivot tables to review lab variance

• Rationale for rejecting spurious data
RESULTS

• YS reduction ratios ranged from 99% at 300°F to 76% at 400°F by averaging results

• Variation in YS between labs for all heats was approximately 10% for most materials – The highest variation was in 25 Cr and ASTM 453 Gr. 660 material – around 30%
### HPHT Metallic Material Yield Strength Reduction Ratios

Shown in % reduction from Room Temperature (75ºF)

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature- ºF</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Cr Super Duplex</td>
<td></td>
<td>81</td>
<td>78</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>ASTM A453 Gr. 660</td>
<td></td>
<td>99</td>
<td>95</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>718 (per Spec 6A718)</td>
<td></td>
<td>94</td>
<td>93</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>725/625 Plus</td>
<td></td>
<td>95</td>
<td>93</td>
<td>91</td>
<td>Test results and data - difficult to correlate</td>
</tr>
<tr>
<td>925</td>
<td></td>
<td>95</td>
<td>95</td>
<td>91</td>
<td></td>
</tr>
</tbody>
</table>
# COMPARISON DATA

Selected HPHT Metallic Material Yield Strength Reduction Ratios Compared with Values from Literature - % Reduction from RT

<table>
<thead>
<tr>
<th>Temperature- °F</th>
<th>Material</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25 Cr Super Duplex</td>
<td>81</td>
<td>78</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25 Cr (various UNS)</td>
<td>80</td>
<td>78</td>
<td>76</td>
<td>ASME BPVC Part D, Table Y-1</td>
</tr>
<tr>
<td></td>
<td>718 (per Spec 6A718)</td>
<td>94</td>
<td>93</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>718</td>
<td>93</td>
<td>93</td>
<td>96</td>
<td>MIL Handbook 5 (not 6A718?)</td>
</tr>
<tr>
<td></td>
<td>925</td>
<td>95</td>
<td>95</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td></td>
<td>925</td>
<td>93</td>
<td>93</td>
<td>93</td>
<td>Huntington Alloys</td>
</tr>
</tbody>
</table>
CONCLUSIONS

• Inconsistent data caused by testing problems should be discarded after examination of lab reports
• Limited material availability prevented retests
• Small data sets limited statistical analysis
• Results in three materials compared favorably with literature values
RECOMMENDATIONS

• Test larger data set (10-20 heats of each material and temperature) for statistical analysis
• Use similar smaller bars of each material heat from various manufacturers
• Establish the lower bound on the confidence interval for a data set
ACKNOWLEDGEMENTS

• API SC6 and ECS

• Suppliers
  – Foroni
  – Howco
  – Hytemp
  – Sandvik
  – Eastham Forge
  – Special Metals (including test data)
  – US Bolt
  – Weir Alloys
AWHEM HPHT TASK GROUP

2006

- Bob Barnett – Wood Group
- Anton Dach – ABB Vetco Gray
- Keith Farquharson – StreamFlo
- Manuel Maligas - Consultant
- Mike Miller – Dril-Quip
- Ron McGregor, Chair – Halliburton
Analysis of 5-1/8 15ksi 6BX Flange Under Combined Loading

Performed by Stress Engineering Services
Summary

• 3-D ABAQUS Analysis
• Same stress criteria as used for Bulletin 6AF2
• Objectives:
  – Load curves similar to those of 6AF2
  – Make 6AF2 cover all API 6A flanges
Flange Model

Tension Side of Bending Linearized Section Locations
(View of the Symmetry Plane on Tension Side)
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>ASME Classification</th>
<th>Membrane Component $S_{lm}$</th>
<th>Membrane and Bending $S_{lb}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flange Sections</td>
<td>Hub Sections</td>
</tr>
<tr>
<td>1</td>
<td>Make up only</td>
<td>Primary</td>
<td>$S_m$*</td>
<td>$S_m$</td>
</tr>
<tr>
<td>2</td>
<td>Test pressure only*</td>
<td>Primary</td>
<td>$S_T$*</td>
<td>$S_T$</td>
</tr>
<tr>
<td>3</td>
<td>Make up plus test pressure</td>
<td>Primary Secondary</td>
<td>$S_T$</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Work pressure plus tension plus bending moment</td>
<td>Primary</td>
<td>$S_m$</td>
<td>$S_m$</td>
</tr>
<tr>
<td>5</td>
<td>Make up plus work pressure plus tension plus bending moment</td>
<td>Primary Secondary</td>
<td>$S_m$</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Make up plus work pressure plus tension plus bending moment plus temperature</td>
<td>Secondary</td>
<td>1.5 $S_m$</td>
<td>1.5 $S_m$</td>
</tr>
</tbody>
</table>

Stress criteria
Step: Step-1, Makeup = 52,500 psi Bolt Preload
Increment 1: Step Time = 1.000
Primary Var: S, Tresca
Deformed Var: U Deformation Scale Factor: +1.000e+00
Step: Step-1, INTERNAL PRESSURE - 1000 psi w/ PEL
Increment 1: Step Time = 1.000
Primary Var: S, Tresca
Deformed Var: U  Deformation Scale Factor: +1.000e+00
Step: Step-1, Bending Moment - 10000 psi Pipe Wall Stress
Increment 1: Step Time = 1.000
Primary Var: S, Tresca
Deformed Var: U Deformation Scale Factor: +1.000e+00
Stress Combinations

- Stress components from each case were superimposed to find the membrane and membrane plus bending stress intensities from combined loading.

- Flange capacity plots were prepared for the flange, slightly different from the present 6AF plots.
  - 6AF shows plots for the leakage criterion only and for the hub stress criterion only. (4 charts per flange)
  - The present project also shows plots for leakage and hub stress together on the same plot (making 6 plots).
First set of curves

- The first two plots show the limiting loads considering both the leakage criterion and the stress criteria.
- This is quicker than having to consult both sets of curves.
- Curves are shown for 52,500 psi and 40,000 psi bolt prestress.
5-1/8" - 15,000 PSI API 6BX - FLANGE

Bore Pressure vs Bending Moment with Tension

Bolt Makeup Stress = 52,500 psi - Stress & Leakage Criteria

Bore Pressure (Psi)

Bending Moment (Thousand Ft-lbs)

Bolt Makeup Stress = 40,000 psi - Stress & Leakage Criteria

Bore Pressure (Psi)

Bending Moment (Thousand Ft-lbs)
Second set of curves

- These plots show the limiting loads considering only the leakage criterion.
- Curves are shown for 52,500 psi and 40,000 psi bolt prestress.
- The leakage criterion was felt by the design committee to be too conservative. Testing showed that the flange faces can separate and the gasket still maintain a seal.
Last set of curves

• These two plots show the limiting loads considering only the stress criteria.

• Curves are shown for 52,500 psi and 40,000 psi bolt prestress.

• The two sets of curves are nearly identical because the external load capacity is only slightly dependent on the preload.
Recommendations

• Editorially revise the title of RP 6AF2 to “Technical Report on the Capabilities of API 6A Integral Flanges Under Combined Loading”, API TR 6AF2

• The new curves should be added to TR 6AF2 between the 4-1/16 15,000 and the 7-1/16 15,000 psi flange plots.

• A paragraph should be added to the Introduction section of the report as shown on the next slide.
The 5-1/8” 15,000 psi flange was added to API Specification 6A after the completion of the initial work on this TR. To add this new flange, work was done in 2005 using the ABAQUS finite-element system, and based on the same assumptions as for the other flanges. The plots resulting from this effort are included in this edition. An additional set of plots is included for this new flange combining the leakage and stress limitations into a single set of curves.
June 14, 2006

Attention: API T/G Members on 6D Revisions and Corrections

Subject: Minutes of Meeting C1 / SC6 / Task Group 2

Meeting Date: Wednesday June 14, 2006  8:30-12:00A

Location: Hilton Atlanta Hotel, Atlanta, Georgia during the API 83rd Summer Standardization Conference on Oilfield Equipment and Materials.

Meeting was called to order by Rick Faircloth Chairman 6D Task Group on Revisions / Corrections at 8:35A and introductions were made by all in attendance.

6D- 9906-1 Report was given by Rick Faircloth on the on publication of API RP 6DR Repair and Remanufacture of Pipeline Valves. Also the 6D TG chairman will ask API Standards Director to send a courtesy copy to DOT for information.

6D-2002-2 Report was given on the latest ballot for purposed API Spec 6DSS to adoption back of ISO 14723, Subsea Pipeline Valves, as a new API Specification. The voting period started 2/2/06 with closing date of 4/12/06. Ballot results are as follows.

13-Affirative, 0-Negative, 1- Abstain, 6- Not Voting
Response Rate 65%, must be greater than 50%
Approval Rate 100%, must be greater than 65%

29 comments were received with the approved ballots. Some were technical and editorial. 6D TG recommends that the ISO 14723 be adopted back as published by ISO as a new API Spec 6DSS –Subsea Pipeline Valves.

However, as the current ISO14723 (SC2 WG9) is in the 5 year review process and will not be completed and published to until later 2008. The 6D TG will form a Sub-Task Group (members- John Flower, Austin Freeman, Jerry Longmire and Darrel Copsey) to review the comments, recommend revised wording and justification for the purposed API Regional Annex F. The recommendations will be present to the Winter SC6 meeting by end January 2007 for a special letter ballot.
Update was given on the use of API spec 6D check list questions during audits. It appears that about 1/3 of the 399 questions are be asked during the renewable audits, with the majority of then in the area of design.

Status was given by Rick Faircloth -Convener ISO TC67 SC2 WG2 Pipeline Valves on the ballot of ISO- DIS 14313 Pipeline valves. ISO ballot started May 10 with closing October 10, 2006. A comments register will be developed from all comments received and the SC2 WG2 technical expert will meet to resolve all comments. Planning is to go out for FDIS in June 2007 with parallel ballot with API SC6 to have the same publication date for the adopt-back process.

This DIS has included all the current revisions listed in the 22nd Edition of API Spec 6D Annex F, plus additional revisions from CEN. During the TC67-SC2 meeting in London May 19th, 2006, resolution 331 (see below) was issue to ask API Product committees to parallel ballot the API adopt-back at the same time as the ISO FDIS ballot.

Resolution 331: Parallel balloting procedure
ISO/TC 67/SC2 supports the efforts to provide parallel balloting of the API adopt-back at the same time as the ISO FDIS ballot. Therefore it is essential that ISO CS provides all proposed editorial changes to the FDIS, after the ballot closes, to the SC2 Secretariat for approval by the project leader and relevant API committee officers, along with adequate time for review.

Rick Spears with Flowserve presented a power point presentation a justification of additional wording to be added to the text on allowable stresses in clause 16.7.2 for drive trains. After much discussion, the TG agreed to added the revised wording to the US comments during the ISO DIS 14313 ballot.

TG discuss the inclusion of (activities requiring validation) in API Spec 6D as requested by API SC18. TG will take up this issue as part of our next TG meeting in Fall 2006 after further clarification from SC18.

The meeting adjourned at 11:00am

Regards,

Rick Faircloth

Chairman- 6D TG on Revisions and Corrections
NEW WORK ITEM PROPOSAL

<table>
<thead>
<tr>
<th>Date of presentation</th>
<th>Reference number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-06-21</td>
<td>(to be given by the Secretariat)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposer</th>
<th>Secretariat</th>
</tr>
</thead>
<tbody>
<tr>
<td>API SC6</td>
<td>ISO/TC 67 / SC 4</td>
</tr>
</tbody>
</table>

A proposal for a new work item within the scope of an existing committee shall be submitted to the secretariat of that committee with a copy to the Central Secretariat and, in the case of a subcommittee, a copy to the secretariat of the parent technical committee. Proposals not within the scope of an existing committee shall be submitted to the secretariat of the ISO Technical Management Board.

The proposer of a new work item may be a member body of ISO, the secretariat itself, another technical committee or subcommittee, or organization in liaison, the Technical Management Board or one of the advisory groups, or the Secretary-General.

The proposal will be circulated to the P-members of the technical committee or subcommittee for voting, and to the O-members for information.

See overleaf for guidance on when to use this form.

**IMPORTANT NOTE:** Proposals without adequate justification risk rejection or referral to originator.

Guidelines for proposing and justifying a new work item are given overleaf.

### Proposal (to be completed by the proposer)

<table>
<thead>
<tr>
<th>Title of proposal (in the case of an amendment, revision or a new part of an existing document, show the reference number and current title)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English title</strong> Petroleum and natural gas industries—Downhole equipment—Subsurface Tubing Mounted Formation Barrier Valves and related Equipment</td>
</tr>
<tr>
<td><strong>French title</strong> (if available)</td>
</tr>
</tbody>
</table>

**Scope of proposed project**

Provide a Petroleum and Natural Gas Industry Product Standard that may be applied on an international basis to facilitate the consistent, safe, and reliable production of Subsurface Tubing Mounted Formation Barrier Valves (sometimes also called Fluid Loss Control Valves) for the Petroleum and Natural Gas Industry.

A barrier valve is a production/injection conduit mounted device whose design function is to retain pressure in one or both directions when closed and additionally open with the application of a pre-determined action(s).

This work effort will be performed by ISO/TC67/SC4/Work Group 4. The WG4 Convenor, Ir. E. Dijkhuis, supports the coming work and has presented it as part of the WG4 work plan (pending ballot approval) to TC67/SC4 at its May, 2006 Plenary Meeting.

**Concerns known patented items** (see ISO/IEC Directives Part 1 for important guidance)

- [ ] Yes
- [x] No

- If “Yes”, provide full information as annex

**Envisaged publication type** (indicate one of the following, if possible)

- [x] International Standard
- [ ] Technical Specification
- [ ] Publicly Available Specification
- [ ] Technical Report

**Purpose and justification** (attach a separate page as annex, if necessary)

This new International Standard is envisioned to establish requirements for subsurface barrier valve equipment. A review of the industry covering operators and manufacturers shows a lack of a standardized set of requirements by which operators may order equipment. This standard will bring to the industry a consistent set of requirements for the production of barrier valves. The basis for this work will be the ISO 10432 standard on Subsurface Safety Valves.

Currently the are approximately 14 volunteers from the operator/manufacturer community to work on the project. These represent five countries.

**Target date for availability** (date by which publication is considered to be necessary) 2009-09

**Relevant documents to be considered**

- ISO 10432, API 14A equivalent

**Relationship of project to activities of other international bodies**

It would be expected that the resultant ISO standard would be adopted back by the American Petroleum Institute under Subcommittee 6 as a product specification in the API Monogram Program.
**New work item proposal**

<table>
<thead>
<tr>
<th>Liaison organizations</th>
<th>Need for coordination with:</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td>[ ] IEC [x] CEN [ ] Other (please specify)</td>
</tr>
</tbody>
</table>

**Preparatory work** (at a minimum an outline should be included with the proposal)

- [x] A draft is attached
- [ ] An outline is attached. It is possible to supply a draft by

The proposer or the proposer's organization is prepared to undertake the preparatory work required  [x] Yes [ ] No

<table>
<thead>
<tr>
<th>Proposed Project Leader (name and address)</th>
<th>Name and signature of the Proposer (include contact information)</th>
</tr>
</thead>
<tbody>
<tr>
<td>David McCalvin Schlumberger <a href="mailto:dmccalvin@slb.com">dmccalvin@slb.com</a></td>
<td>George Huntoon Chair, API SC6 Ph: 281/235-0330</td>
</tr>
</tbody>
</table>

**Comments of the TC or SC Secretariat**

**Supplementary information relating to the proposal**

- [x] This proposal relates to a new ISO document;
- [ ] This proposal relates to the amendment/revision of an existing ISO document;
- [ ] This proposal relates to the adoption as an active project of an item currently registered as a Preliminary Work Item;
- [ ] This proposal relates to the re-establishment of a cancelled project as an active project.

Other:

**Voting information**

The ballot associated with this proposal comprises a vote on:

- [x] Adoption of the proposal as a new project
- [ ] Adoption of the associated draft as a committee draft (CD) (see ISO Form 5, question 3.3.1)
- [ ] Adoption of the associated draft for submission for the enquiry vote (DIS or equivalent) (see ISO Form 5, question 3.3.2)

Other:

**Annex(es) are included with this proposal** (give details)

- [ ]

**Date of circulation**

<table>
<thead>
<tr>
<th>Date of circulation</th>
<th>Closing date for voting</th>
<th>Signature of the TC or SC Secretary</th>
</tr>
</thead>
</table>

**Use this form to propose:**

a) a new ISO document (including a new part to an existing document), or the amendment/revision of an existing ISO document;
b) the establishment as an active project of a preliminary work item, or the re-establishment of a cancelled project;
c) the change in the type of an existing document, e.g. conversion of a Technical Specification into an International Standard.

This form is not intended for use to propose an action following a systematic review - use ISO Form 21 for that purpose.

Proposals for correction (i.e. proposals for a Technical Corrigendum) should be submitted in writing directly to the secretariat concerned.

**Guidelines on the completion of a proposal for a new work item**

(see also the ISO/IEC Directives Part 1)

a) **Title**: Indicate the subject of the proposed new work item.
b) **Scope**: Give a clear indication of the coverage of the proposed new work item. Indicate, for example, if this is a proposal for a new document, or a proposed change (amendment/revision). It is often helpful to indicate what is not covered (exclusions).
c) **Envisaged publication type**: Details of the types of ISO deliverable available are given in the ISO/IEC Directives, Part 1 and/or the associated ISO Supplement.
d) **Purpose and justification**: Give details based on a critical study of the following elements wherever practicable. *Wherever possible reference should be made to information contained in the related TC Business Plan.*

1. The specific aims and reason for the standardization activity, with particular emphasis on the aspects of standardization to be covered, the problems it is expected to solve or the difficulties it is intended to overcome.
2. The main interests that might benefit from or be affected by the activity, such as industry, consumers, trade, governments, distributors.
3. Feasibility of the activity: Are there factors that could hinder the successful establishment or general application of the standard?
4) Timeliness of the standard to be produced: Is the technology reasonably stabilized? If not, how much time is likely to be available before advances in technology may render the proposed standard outdated? Is the proposed standard required as a basis for the future development of the technology in question?

5) Urgency of the activity, considering the needs of other fields or organizations. Indicate target date and, when a series of standards is proposed, suggest priorities.

6) The benefits to be gained by the implementation of the proposed standard; alternatively, the loss or disadvantage(s) if no standard is established within a reasonable time. Data such as product volume or value of trade should be included and quantified.

7) If the standardization activity is, or is likely to be, the subject of regulations or to require the harmonization of existing regulations, this should be indicated.

If a series of new work items is proposed having a common purpose and justification, a common proposal may be drafted including all elements to be clarified and enumerating the titles and scopes of each individual item.

e) Relevant documents: List any known relevant documents (such as standards and regulations), regardless of their source. When the proposer considers that an existing well-established document may be acceptable as a standard (with or without amendment), indicate this with appropriate justification and attach a copy to the proposal.

f) Cooperation and liaison: List relevant organizations or bodies with which cooperation and liaison should exist.
API C1-SC6
Materials Task Group Report
15 June 2006

Tim Haeberle
Vetco Gray
API Specification 6A718 Update

“Specification of Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment”

✔ March 2004: Original issue date

✔ March 15, 2005: Errata issued

- The Errata was issued to replace two of the original photomicrographs with ones that more accurately represent the acceptable microstructure.

✔ March 31, 2006: Addendum issued

- The Addendum was issued to revise the grain size requirement after a ballot item standardizing the grain size passed.
Minutes of Meeting
PSL3G Task Group

Meeting: 2/22/06
Place: at FMC Gears Rd. Houston

Meeting commenced at 1:00pm. The TG chairmen, George Huntoon reviewed the TG work scope as detailed on the NWI Form (PSL3G Gas Testing Criteria). The slides presented at the 2005 annual meeting were reviewed to frame the issues. The slides show four possible interpretations of section 7.4.9.5.8. API has issued an interpretation defining the intent (see Att 15).

The FMC letter with proposed language to clarify PSL3G test Protocols was thoroughly reviewed and discussed. The task group considered eliminated some of the hydrotest requirements for PSL3G; however, the consensus of the task group is to remove the wording “or in place of” in article 7.4.9.5.8 (PSL3G gas seat test-Valves). A motion was made to remove the wording “or in place of”. Motion was seconded by Jerry Longmire. The motion was voted and passed unanimously.

Additional changes were recommended for clarity:

- Add wording from API 17D draft to require hydrotesting prior to any gas testing. 17D section 5.4.6.2.1 “A hydrostatic body test and a hydrostatic valve seat test shall be performed prior to any gas testing. The requirements for hydrostatic testing shall be the same as PSL 3.” This requirement will replace the statement in 7.4.9.1 “The sequence of other tests shall be at the option of the manufacturer.”

- Clarify the pressure drop criteria in section 7.4.9.5.8 (b) Acceptance Criteria, A maximum reduction of the gas test pressure of 2.0 MPa (300psi) for high pressure tests and .2 MPa (30psi) for low pressure tests is acceptable as long as there are no visible bubbles in the water bath during the holding period”.

The three issues discussed above were reviewed by the task group and all participate were in agreement. The task group had a conversation with Brian Skeels (17D) and we noted that 17D and 6A are not in alignment on pressure testing. The TG recommends 17D defer or reference all components testing to the 6A requirement.

Meeting adjourned at 3:45PM

George Huntoon
Task Group Chairman
A.P.I -S.C.6

Surface-Well head and Xmass tree Eq.

Scope:
Standardization of wellheads and xmass trees as used in the oil and gas industry
Convenor RiesLangereis
Standard History

• A.P.I 6A first issued November 1947
• A.P.I 6A now in its 19th version issued 2005
• I.S.O 10423 first issued 1998
• I.S.O 10423 has now 3rd edition
• Fourth edition is in preparation
• AWHEM role now clearer
Work programme 2005/6

• To follow ISO 10423 3rd edition; published end 2003
• To follow API 6A new standard 19th version; effective date Feb. 1 2005
• Many informal (ISO) and formal meetings (API) held within various settings
• First listing prepared for ISO new version
• NACE MR0175/ISO 15156 issued end 2003 - first results in
API 6A-19th version

- ISO 15156-2003 version fully embraced
- Two more material specs included for sour services
- Spec ZZ-sour spec user defined and tested with the new NACE spec avoiding balloting procedures
- Temperature effects further defined
API 6A -19th version perceived setbacks

• Allowance for castings in line with 17th version
• ISO chapter on repair and remanufacture has been deleted
• A resolution on the R&R will be discussed in New Work Items
• Consequently API 6A still different from ISO 10423 -3rd
Action list for 2006 for ISO 10423

- Keep 3rd version current
- A new work item has been proposed and accepted Q3 2005
- Prepare the 4th edition of ISO-10423 objectives being:
  - Technically update with the objective that it is identical to the 20th version of API-6A
  - To ascertain which technical areas for the new version can be brought in line with the 19th version of API 6A. New NACE first results good.
New work item proposal

- Core document/standard for the common user
- Any MMS requirement should appear in the API 6A regional annex
- Any other valid changes from any source identified as being essential to improve the standard
Areas of concern

• Main areas of difference between API 6A and ISO 10423
• New NACE needs to be incorporated in the ISO 10423 new version
• Major Oil Companies lack of input; mainly manufacturers –no breakers!!
New ISO workgroup members

Davy Stewart-Shell,
Scott Higgins-BP,
Mario Schiatti Breda
Maarten Kuipers-Mokveld
Roberto Massoni Agip
Still need a metallurgist -independent
Planned programme 2006/7

- Plan concerted effort with API -6, next meeting June Atlanta, in concurrence
- Subsequently hold kick-off meeting Sept. WG forgings/castings
- API to propose way forward with QA/QC castings standard/supply chain mgmt
- Finalize list of updates—with AWHEM
Action items for ISO /TC67/SC4

• Agree action plan
• Provide steering/advice for the above
• Provide /help with some new workgroup members-metallurgist
Joint action Plan 2006/2007

• ISO 10423 / API SC6 TG on forgings vs castings will be established and report mid 2007
• Make general update list with API focal point, ready summer 2007
• General feedback required on new NACE/ISO15156
<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Company</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>David Dott</td>
<td>Baker Oil Tools</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Steve Smith</td>
<td>Saudi Aramco</td>
<td><a href="mailto:stephen.smith@aramco.com">stephen.smith@aramco.com</a></td>
</tr>
<tr>
<td>3</td>
<td>Jerry Coleman</td>
<td>LGP Co</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>John Yorke</td>
<td>Halliburton</td>
<td><a href="mailto:jorke@halliburton.com">jorke@halliburton.com</a></td>
</tr>
<tr>
<td>5</td>
<td>Kendall Leene</td>
<td>Weatherford</td>
<td><a href="mailto:kendall.kea@weatherford.com">kendall.kea@weatherford.com</a></td>
</tr>
<tr>
<td>6</td>
<td>Sterling Lewis</td>
<td>Exxon Mobil</td>
<td><a href="mailto:sterling.f.lewis@exxonmobil.com">sterling.f.lewis@exxonmobil.com</a></td>
</tr>
<tr>
<td>7</td>
<td>Roy Benefield</td>
<td>FMC</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Gary Devlin</td>
<td>Cameron</td>
<td><a href="mailto:devlin@camerondiv.com">devlin@camerondiv.com</a></td>
</tr>
<tr>
<td>9</td>
<td>Syed Ali</td>
<td>FMC</td>
<td><a href="mailto:syed.ali@fmc.top.com">syed.ali@fmc.top.com</a></td>
</tr>
<tr>
<td>Issue Requiring Attention</td>
<td>Suggested Changes &amp; Comments</td>
<td>Rationale</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td><strong>Elimination of PSL-4</strong> - this option is no longer included as part of the recommendations in Annex A. Due to the complexity of this level of requirements and individuals customers needs, it is usually associated with additional specs and is not supplied as standard PSL-4.</td>
<td>Remove the PSL-4 requirements form the document. Could be separated out as a recommended practice if the users feel it is needed.</td>
<td>PSL-4 is no longer a recommended practice in Annex A and is usually modified by the user selecting. Almost never used as a standard requirement without modification, thereby defeating the purpose of this option in a standard type document.</td>
<td></td>
</tr>
<tr>
<td><strong>Performance Requirements (PR)</strong> – We currently have three different performance requirement levels in the document which leads to confusion and a lack of standardization. Due to customer preferences for certain items such as valves, the manufacturers are required to perform qualification testing to PR-2, Annex F requirements as a standard requirement.</td>
<td>Re-evaluate the performance requirements for each product line and develop one set of PR requirements based on market demand.</td>
<td>Consolidation of the requirements based on typical market demand for the products would eliminate considerable confusion in the market for these products. Use existing criteria for Annex F as the standard for PSL-3 and higher applications.</td>
<td></td>
</tr>
<tr>
<td><strong>Temperature Classes</strong> – The list of temperature has been expanded to a point where certain of the options are seldom used to meet the demands of the market.</td>
<td>Re-evaluate the temperature classes based on the typical demands of the market.</td>
<td>Re-alignment of the temperature classes with the needs of the market will eliminate confusion and promote standardization. For example, consider the elimination of Temperature Classes R, S, T, V &amp; Y as there does not appear to be much demand if any for these categories.</td>
<td></td>
</tr>
<tr>
<td><strong>Material Classes</strong> – The list of temperature has been expanded to a point where certain of the options are seldom used to meet the demands of the market.</td>
<td>Re-evaluate the material classes based on the typical demands of the market.</td>
<td>Re-alignment of the temperature classes with the needs of the market will eliminate confusion and promote standardization. For example, consider the elimination of Material Classes BB, CC and ZZ as there does not appear to be much demand if any for these categories.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>Wafer Check Valves, Reduced Opening Plug Valves and Fluid Sampling Devices</strong> – Remove the products from the standard as they no longer fit with market demand for wellhead products and are seldom produced with the API Monogram.</td>
<td>Recommend removal from the standard. We might consider spinning these off into a separate standard if they are truly needed in the market.</td>
<td>These categories do not appear to fit in the scheme of the document for the product offerings.</td>
<td></td>
</tr>
<tr>
<td><strong>15 KSI Long Pattern Valves</strong> – Delete this option as it does not appear to be needed in the market.</td>
<td>Recommend deletion of this option.</td>
<td>This option does not appear to be needed to support the current market demands.</td>
<td></td>
</tr>
<tr>
<td><strong>316 SS Ring Groove Inlay</strong> – Remove this option as the market has shifted to the use of Alloy 625 for this application.</td>
<td>Recommend removal of this option.</td>
<td>Customers typically now require Alloy 625 in lieu of the austenitic stainless steel inlay option.</td>
<td></td>
</tr>
<tr>
<td><strong>PSL Limitations</strong> – Re-evaluate the using of the various PSL and develop realistic options for use to ensure requirements are aligned with the application.</td>
<td>Consider limiting PSL-1 to 5K applications, PSL-2 for 10K, 15K &amp; up to PSL-3G. Reduces the various options ad the pressure and temperature requirements get more severe.</td>
<td>This type of approach would eliminate confusion, promote standardization, but would also re-evaluate the guidelines in Annex A regarding &quot;Primary Equipment&quot;.</td>
<td></td>
</tr>
<tr>
<td><strong>Section 7 &amp; 10</strong> – When trying to determine the basic requirements for a particular type of equipment, the user of the document is forced to constantly shift back and forth from Section 7 to Section 10. This is not only time consuming, but leads to confusion.</td>
<td>Consolidate the requirements of these two sections into one set of requirements for each type of product. Leave Section 10 as the section with the dimensional tables only. This would eliminate considerable confusion for the user of the document when trying to identify the requirements applicable to a particular product.</td>
<td>This re-organization would improve the user’s ability to locate the requirements applicable for each of the products.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>Repair &amp; Remanufacture</strong> – Develop proposal for correcting the void created by the elimination of Annex J. Although this seemed like the only position we could take at the time, it has led to confusion in the Industry. George Huntoon plans to introduce a proposal at the June Conference to develop a Recommended Practice using the recently completed API RP 6D as the precedent.</td>
<td>We recommend the development of a recommended practice to fill this void.</td>
<td>Develop proposal for the development of and RP or an informative Annex to define guidelines for the repair and remanufacture.</td>
<td></td>
</tr>
<tr>
<td><strong>NDT – PT vs. MT</strong> – When the original requirements were set up for the PSL method of differentiating equipment, MT was limited for use on ferromagnetic materials. If PT is suitable for validating the existence of a surface rupture when using MT, it should be an acceptable method for surface NDT of ferromagnetic materials.</td>
<td>Allow use of PT as an alternative to MT for ferromagnetic materials. Needs to address sensitivity level issue and the process qualification.</td>
<td>If PT is a viable option for validating an indication detected by MT examination, in a ferromagnetic component, then it should be considered a viable option for surface NDT of ferromagnetic components provided the proper sensitivity level is used.</td>
<td></td>
</tr>
</tbody>
</table>
## AWHEM Recommendations for Improvement
### ISO 10423 / API Specification 6A

<table>
<thead>
<tr>
<th>Section</th>
<th>Recommendation</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NDT – PT Sensitivity</strong> – ASTM E165 provides for various levels of sensitivity. Our current document does not define the sensitivity level required although a user with a thorough understanding of the procedure qualification requirements of E165 would address this during the validation of their process.</td>
<td>The document needs to require a level of sensitivity for using PT for ferromagnetic and non-ferromagnetic materials equivalent to the sensitivity requirements for MT as currently specified in the document. This closes a loophole in the document.</td>
<td>By adding this definition of the sensitivity level to the document, we feel this would significantly reduce confusion on this issue.</td>
</tr>
<tr>
<td><strong>Pressure Testing – Validity of the 0.5% Accuracy Range for pressure Measuring Devices</strong> – This requirement has been in the standard for many years, but no one seems to know the origin. Since there is no tolerance in API Spec 6A, the normal guidelines for determining the required accuracy of the pressure measuring devices cannot be established. Instead, this is just one little picky point used by auditors and third party inspectors to berate the manufacturers.</td>
<td>Recommend relaxing the tolerance to +/- 2% to allow use of standard pressure gauges per ASME B40.1. At the present time, there are only a few gauge manufacturers in the world who make high pressure dial type gauges to meet the +/- 0.5% full scale range requirement of API Spec 6A.</td>
<td>The accuracy of measuring and test equipment is usually determined by the specified tolerance for which the M&amp;TE is to be used for verification. In the absence of a defined tolerance, equipment is usually selected based on availability per a commercial standard.</td>
</tr>
<tr>
<td><strong>PR Language</strong> – The language in the body of the document describes the standard PR requirements as design requirements.</td>
<td>Although most manufacturers understand that it is necessary to test to validate the design requirements, we feel this is another loophole that needs to be closed.</td>
<td>Define the PR for each product, eliminate the need for PR-1 and PR-2.</td>
</tr>
<tr>
<td><strong>Pressure Recording Devices</strong> – During the past few years, most of the manufacturers have had to deal with auditors who determine a pressure chart recorder to be a pressure measuring device. In virtually every case, API staff comes at the manufacturer over the issue raised in the audit and the battle ensues. In some cases, the manufacturer has been able to win the argument and some cases they have lost.</td>
<td>We need to clarify this requirement to eliminate confusion. A calibration tolerance for pressure chart recorders may be needed to end this debate.</td>
<td>This would eliminate confusion and reduce frustration for the manufacturers who are continually placed in the position of explaining the actual requirements of the document.</td>
</tr>
<tr>
<td>SSV's - Re-evaluate the testing requirements and include the language in the body of the document. The move to try and realign the Class I and Class II requirements from 14D with the PR-1 and PR-2 requirements of API Spec 6A has created considerable confusion.</td>
<td>Re-evaluate this entire section to ensure requirements are consistent with the original 14D requirements.</td>
<td>The restructuring of these requirements would eliminate confusion and ensure continuity with the original requirements of 14D.</td>
</tr>
</tbody>
</table>
NACE / API E&P LIAISON REPORT -- JUNE 2006


ISO has published four Technical Corrigenda for the parts of NACE MR0175/ISO 15156:
- Technical Corrigendum 1 – Part 1
- Technical Corrigendum 1 – Part 2
- Technical Corrigendum 1 – Part 3
- Technical Corrigendum 2 – Part 3

These changes are the results of 15 ballot items that were passed by the Maintenance Panel and NACE TG 299 (oversight committee) in 2004 and 2005. One of them simply removes trade names from tables and uses only UNS numbers instead, but some of the others involve significant technical changes. Technical Corrigendum 2 for Part 3 is 18 pages long and includes many tables. ISO chooses to publish these as technical corrigenda and wait until the 5-year revision to include them in the main text. At the time of the 5-year revision, they will also have to be voted on by the member bodies of ISO/TC 67, but hopefully there won’t be any problems.

The corrigenda are downloadable free for NACE members from the NACE Web site, and also downloadable free for anyone from the ISO Livelink Web site.

The Maintenance Panel handled 31 technical inquiries during 2005 (with 3 still outstanding) and has received 9 so far in 2006, with 5 still outstanding. Inquiries and answers completed as of March 1, 2006, with 5 still outstanding. Inquiries and answers completed as of March 1, 2006, are posted on the ISO Web site: www.iso.org/iso15156maintenance.

Technical Publications Released Since June 2005:

--- New Standards Related to Production and Pipelines

RP0205-2005“Recommended Practice for the Design, Fabrication, and Inspection of Tanks for the Storage of Petroleum Refining Alkylation Unit Spent Sulfuric Acid at Ambient Temperatures”

--- Standards and Reports Related to Production and Pipelines Revised or Reaffirmed Since June 2005 --

TM0177-2005“Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H₂S Environments”


If there are questions or more information is desired please contact NACE Technical Activities Department at: 281/228-6221 or email Linda.Goldberg@mail.nace.org or contact your liaison representative at: 214/348-7692 or email: hbyars@swbell.net.

Harry G Byars
NACE/API E&P Liaison Representative

June 07, 2006